

**MIDTERM REVIEW TOPICS**

NAME: \_\_\_\_\_

Chapters 1 and 3:

- Distinguish between physical and chemical properties
- Distinguish between physical and chemical changes
- Distinguish between qualitative and quantitative
- Explain the difference between mass and weight
- Classify matter
  - Element
  - Compound
  - Pure substance
  - Homogeneous mixture
  - Heterogeneous mixture
- Describe specific processes
  - Distillation
  - Filtration
  - Crystallization
  - Chromatography
- Determine the number of atoms in a formula
- Explain the scientific method and know the steps
- Distinguish between independent and dependent variables
- Distinguish between
  - Law
  - Theory
  - Hypothesis
  - Observation
- Explain endothermic and exothermic
- Demonstrate knowledge of the Law of Conservation of Mass

Chapter 2:

- Density
  - Calculate density, volume, and mass
  - Determine the density of a substance using the slope of a line
- Conversions
  - Metric system
  - SI system of Units
  - Factor labeling
- Significant figures
  - Determine sig figs
  - Round sig figs
  - Add, subtract, multiply, and divide using sig figs
- Scientific notation
  - Write numbers in scientific notation
  - Add, subtract, multiply, and divide using scientific notation

Chapters 4 and 25:

- Know the contributions made by each scientist in the development of atomic structure and be able to describe experiments associated with these scientists:
  - Democritus
  - Dalton
  - Thomson (cathode ray experiment and the discovery of the electron)
  - Rutherford (gold foil experiment and the discovery of the nucleus)
  - Chadwick (discovery of the neutron)

- Describe the structure of the atom
  - Protons
  - Neutrons
  - Electrons
- Be able to calculate atomic mass
- Be able to calculate mass number and distinguish it from atomic mass
- Isotopes
  - Description
  - Isotope notation
  - Nuclear notation
- Radioactivity
  - Calculate half-life
  - Explain the band of stability and be able to predict the type of decay that would occur for any given radioactive isotope
  - Describe the types of radiation
  - Write the equations of the five types of radioactive decay
    - Alpha
    - Beta
    - Gamma
    - Positron emission
    - Electron capture

#### Chapter 5:

- Electromagnetic spectrum
  - Description
  - Calculate frequency, energy, and wavelength of an electromagnetic wave
- Valence electrons
  - Definition
  - Significance
  - Determine the number of valence electrons of an element
  - Draw the electron-dot structure of an element
- Electron configuration
  - Write the electron configuration of an element
  - Write the orbital diagram of an element
  - Write the noble gas configuration of an element

#### Chapter 6:

- Periodic table
  - Determine if an element is a metal, nonmetal, or metalloid
  - Know the properties of metals, nonmetals, and metalloids
  - Explain the history and trends of the periodic table
  - Describe elements in terms of group, period, block, and family name
  - Know the properties of the families of the periodic table
- Understand the concept of periodic law
- Determine if an element will form an anion (negatively charged ion) or a cation (positively charged ion)
- Determine the charge of the most commonly formed ion